## REMARKS

The present Amendment amends claims 1, 3, 5, 6, 8, 10 and 11 and cancels claims 4 and 9. Therefore, the present application has pending claims 1, 3, 5, 6, 8, 10 and 11.

In paragraph 3 of the Office Action the Examiner objected to the drawings. Specifically, the Examiner indicates that the term "reflected" in Fig. 4 should be replaced with the term "unreflected". Filed on even date herewith are Proposed Drawing Corrections/Replacement Sheet correcting the term "reflected" with the term "unreflected". Therefore, this objection is overcome and should be withdrawn.

The title stands objected to in paragraph 5 of the Office Action as not being descriptive of the present invention. The title of the invention was changed to "CACHE FLUSH BASED ON CHECKPOINT TIMER", which Applicants submit is descriptive of the invention. Therefore, this objection is overcome and should be withdrawn.

The Abstract stands objected to due to informalities noted by the Examiner in paragraph 6 of the Office Action. Amendments were made to the Abstract to the correct the informalities noted by the Examiner. Therefore, this objection is overcome and should be withdrawn.

The disclosure stands objected to due to informalities noted by the Examiner in paragraph 7 of the Office Action. Amendments were made throughout the specification to correct the informalities noted by the Examiner in paragraph 7 of the Office Action. Therefore, this objection is overcome and should be withdrawn.

Claims 6 and 8-10 stand objected to under 37 CFR §1.75 as allegedly being substantial duplicates of claims 1 and 3-5 respectively. Amendments were made to each of claims 6, 8 and 10 in order to recite features of the present invention so that the subject matter of claims 6, 8 and 10 are different from the subject matter of claims 1 and 3-5. Therefore, reconsideration and withdrawal of this objection is respectfully requested.

Claims 1 and 3-5 stand rejected under 35 USC §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regards as their invention. Various amendments were made throughout claims 1 and 3-5 to bring them into conformity with the requirements of 35 USC §112, second paragraph. Therefore, this rejection with respect to claims 1 and 3-5 is overcome and should be withdrawn.

Specifically, amendments were made throughout claims 1 and 3-5 to overcome the objections noted by the Examiner in the Office Action.

Claim 11 stands rejected under 35 USC §101 as allegedly being directed to non-statutory subject matter. Amendments were made to claim 11 to clarify that claim 11 is directed to an article of manufacture namely a computer readable medium having stored thereon a data processing program which is executed by a computer so as to perform various steps. An article of manufacture having stored thereon a computer program is one of the permitted statutory classes of subject matter in accordance with 35 USC §101. Therefore, reconsideration and withdrawal of this rejection is respectfully requested.

Claims 1, 3-6 and 8-11 stand rejected under 35 USC §103(a) as being unpatentable over Prabhakaran (U.S. Patent No. 5,922,040) in view of Kano (U.S. Patent No. 6,088,773). This rejection is traversed for the following reasons. Applicants submit that the features of the present invention as now more clearly recited in claims 1, 3-6 and 8-11 are not taught or suggested by Prabhakara or Kano whether taken individually or in combination with each other as suggested by the Examiner. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw this rejection.

Amendments were made to the claims to more clearly describe features of the present invention. Particularly, amendments were made to each of the independent claims to more clearly recite that the present invention is directed to a cache control method in a data processing system having a computer for executing a program, and a storage unit having a cache memory for storing data transmitted as a result of execution of said program, a cache controller having a cache management table and a disk device having memory medium for storing data stored in said cache memory.

According to the present invention the computer makes and sends a write request, in a write-through mode, thereby to update data of the program unreflected upon said disk device, issues a flush command to said storage unit in order to reflect a page being on said cache memory unreflected upon said memory medium, onto said memory medium, and makes and sends a write request, in the write-through mode, to said storage unit for requesting write of a synchronous point journal which records, in the storage unit, completion of a synchronous point process until a check point from said computer to said storage unit.

Further, according to the present invention the cache controller of said storage unit, responding to said flush command from said computer, if a mode in said cache management table corresponding to a page for said flush command coincides with write-after, writes the page indicated by a cache pointer for the page in said cache management table to said memory medium and changes a cache management entry in said cache management table to a state of reflected. The cache controller of said storage unit, responding to said write request, if a mode designated during said write request is write-after, also writes data in said cache memory, and changes said cache management entry for the page to a state of unreflected, and responding to said write request, if said mode designated during said write request is not write-after, writes the page to both said cache memory and said memory medium, thereafter changes said cache management entry for the page to the state of reflected.

The above described features of the present invention as now more clearly recited in the claims are not taught or suggested by any of the references of record whether taken individually or in combination with each other. Particularly, the above described features of the present invention are as now more clearly recited in the claims are not taught or suggested by Prabhakaran or Kano whether taken individually or in combination with each other as suggested by the Examiner.

Prabhakaran teaches a cache memory with flush operation and Kano teaches a program for transmitting a request for flushing.

However, the combination of Prabhakaran and Kano does not teach or suggest the features of the present invention wherein said computer makes

and sends a write request, in a write-through mode, thereby to update data of the program unreflected upon said disk device, issues a flush command to said storage unit in order to reflect a page being on said cache memory unreflected upon said memory medium, onto said memory medium, and makes and sends a write request, in the write-through mode, to said storage unit for requesting write of a synchronous point journal which records, in the storage unit, completion of a synchronous point process until a check point from said computer to said storage unit as recited in the claims.

Further, the combination of Prabhakaran and Kano does not teach or suggest the features of the present invention wherein said cache controller of said storage unit, responding to said flush command from said computer, if a mode in said cache management table corresponding to a page for said flush command coincides with write-after, writes the page indicated by a cache pointer for the page in said cache management table to said memory medium and changes a cache management entry in said cache management table to a state of reflected as recited in the claims.

Still further, the combination of Prabhakaran and Kano does not teach or suggest the features of the present invention wherein said cache controller of said storage unit, responding to said write request, if a mode designated during said write request is write-after, writes data in said cache memory, and changes said cache management entry for the page to a state of unreflected, and wherein said cache controller of said storage unit, responding to said write request, if said mode designated during said write request is not write-after, writes the page to both said cache memory and said memory medium,

thereafter changes said cache management entry for the page to the state of reflected as recited in the claims.

As described above, even in the event that a fault causing the contents of the cache memory of a storage unit to be lost takes place, it can be guaranteed that update contents of the application program prevailing up to the synchronous timing (check point or commitment) can be written in the memory medium and therefore, in the recovery process of the application program after the occurrence of the fault, the recovery start can be determined accurately by use of the features of the present invention as recited in the claims.

Further, the sequential cache flush can be carried out by controlling the application program and therefore, in the event that a power supply failure takes place in the storage unit having a cache memory of a large capacity, a large amount of time required for handling the stop process can be avoided not by the control of the application but by the flush process of a large amount of update data stored in the cache memory by use of the features of the present invention as recited in the claims.

The above described advantages by use of the features of the present invention as recited in the claims are not possible when using the teachings of Prabhakaran or Kano. Prabhakaran and Kano suffer from various deficiencies relative to the features of the present invention as recited in the claims as noted above and as such cannot provide the above described advantages.

Therefore, both Prabhakaran and Kano suffer from the same deficiencies relative to the features of the present invention now more clearly

recited in the claims and as such combining these references in the manner as suggested by the Examiner still fails to teach or suggest the features of the present invention as recited in the claims. Accordingly, reconsideration and withdrawal of the 35 USC §103(a) rejection of claims 1, 3-6 and 8-11 as being unpatentable over Prabhakaran in view of Kano is respectfully requested.

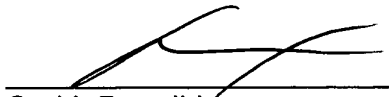
The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references utilized in the rejection of claims 1, 3-6 and 8-11.

In view of the foregoing amendments and remarks, applicants submit that claims 1, 3-6 and 8-11 are in condition for allowance. Accordingly, early allowance of claims 1, 3-6 and 8-11 is respectfully requested.

To the extent necessary, the applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C., Deposit Account No. 50-1417 (500.43870X00).

Respectfully submitted,

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.



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